

CLAIMS

1. An enclosing structure (1) for a packaging machine (100), said packaging machine (100) including at least
5 two work areas or portions (110;130,120) having different operation tasks, arranged one after another along a packaging line (2) of said machine (100); the structure (1) being characterized in that it includes:

10 enclosing panel-shaped means (P), suitably assembled together to form one or more enclosing chambers(3,4) for protection of each of said work portions (110;130,120);

15 at least one of said chambers (3) being aimed at enclosing, a pressurized environment and at least another chamber being aimed at enclosing a closed environment, whose pressure is equal to the outside pressure.

2. A structure as claimed in claim 1, including:

20 means (20) for generating at least one flow of air (F) to distribute compressed air inside said chambers (3,4);

25 suction means (50,60) for sucking the air from the inside of a definite enclosing chamber (4) generating at least one flow of air (F') at the outlet of said chamber (4), to maintain substantially constant the pressure inside said chamber (4);

30 depuration means (23,24;61), aimed at cooperating with said generating means (20) and with said

suction means (50,60) for depurating the air of said flows (F,F').

3. A structure as claimed in claim 1 or 2, wherein said
5 enclosing chambers (3,4) communicate with each other in regions corresponding to definite slots or passages (6,7), through which the air passes from said chamber (3) with pressurized environment to the other chamber (4).
- 10 4. A structure as claimed in any of the claims from 1 to 3, wherein said packaging machine (100) is an automatic machine, aimed at packaging pharmaceutical products in containers; said work portions (110;130,120) of said packaging machine (100) being defined by a first work
15 portion (120) including at least one station (121) for feeding said pharmaceutical products, and at least one second work portion (110) including at least one station (111) for producing/feeding said containers; said enclosing chamber (3) with pressurized environment
20 enclosing said second work portion (110) and said enclosing chamber (4) with a substantially constant pressure enclosing said first work portion (120) of said packaging machine (100).
- 25 5. A structure as claimed in claim 4, wherein said packaging machine (100) includes also a third work portion (130) having at least one station (131) for closing said containers; said enclosing chamber (3) with pressurized environment being aimed at enclosing said
30 second and third portions (110,130).

6. A structure as claimed in claim 4 and 5, wherein said packaging machine (100) is a blistering machine for packaging pharmaceutical products in blister packs, in which said second work portion (110) includes a station (111) for forming blisters on a band material (115), to form, downstream of the station (111), a blister band (116); and said third work portion (130) including a station (131) for closing said blister band (116) with a corresponding band material.

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7. A structure as claimed in claim 6, wherein said enclosing chamber (3) with pressurized environment includes at least one slot or mouth (33) aimed at allowing said band material (115) to move forward in a defined feeding direction (D) along said packaging line (2); said mouth (33) having fluid-dynamic barrier means (34) for acting on said material (115) and removing therefrom possible contaminating powders or the like.

20 8. A structure as claimed in any of the previous claims from 1 to 7, wherein said enclosing means (P) of said enclosing chamber (3) with pressurized environment include a plurality of panels (P); said enclosing chamber (3) with pressurized environment having an intermediate space (37), situated in the connection area of respective adjacent extremities of two general panels (P', P''), adjacent to each other and forming said chamber (3), and aimed at allowing the air present inside the chamber (3) to go outside in a continuous flow of air f from the inside of the chamber 3 toward outside.

9. A structure as claimed in any of the previous claims from 2 to 8, wherein:

5 said generating means (20) include at least one pump (21) with variable delivery for withdrawing air from the outside environment and conveying withdrawn air through introduction ducts (22a,22b,22c) toward said enclosing chamber (3) with pressurized environment;

10 said depuration means (23,24;61) include filter means (23,24) for filtering the withdrawn air before introducing it into the enclosing chamber (3) with pressurized environment;

15 sensor means (25,26) are connected to said filtering means (23,24) for detecting volume variations of the flow of air and for sending relative control signals to a control unit (29); and

 means (30) for operating said pump (21), are connected to the said pump and to said control unit (29).

20 10. A structure as claimed in claim 9, wherein said filtering means (23,24) include:

 a main filter (23), situated in said introduction duct (22) downstream of said pump (21) and having connected thereto relative sensor means (25); and

25 a secondary filter (24), situated upstream of said pump (21) and having connected thereto relative sensor means (26).

 11. A structure as claimed in claim 10, wherein said

30 sensor means (25,26) include differential manostats,

which measure the differences of pressure upstream and downstream of the relevant filter (23,24).

12. A structure as claimed in any of the previous claims
5 from 2 to 11, wherein said suction means (50,60) include:
- a duct (51) connecting said chamber (4) with
constant pressure with a suction group (60);
 - at least one valve (52), situated in said duct (51)
and having a variable aperture, so as to define the
10 quantity of air (F') withdrawn from said enclosing
chamber (4) with constant pressure;
 - an adjustment central unit (53), controlling the
aperture of said valve (52), to adjust the flow (F')
of air withdrawn from, and exiting, said chamber
15 (4);
 - depuration means (61) for depurating said air flow
(F'); and
 - flow measuring means (54), situated in said outlet
duct (51) and connected to said central unit (53)
20 for adjusting and measuring said flow (F') of air
withdrawn from said chamber (4) and for sending a
relative control signal to the central unit (53).

13. A structure as claimed in claim 12, wherein said flow
25 measuring means (54) include a differential manostat
sensor (55).

14. A method for enclosing a packaging machine (100),
characterized by:

dividing said packaging machine (100) in at least two separate work areas or portions (110;130,120) having different operation tasks and arranged one after another along a packaging line (2) of the machine (100);

enclosing each of said work portions (110;130,120) by and within at least one enclosing chamber (3,4) for protecting said portion (110;130,120);

forming with at least one of said enclosing chambers (3) an environment under pressure, while at least another chamber (4) forms a closed environment, whose pressure is equal to the outside pressure.

15. A method as claimed in claim 14, wherein said packaging machine (100) is an automatic machine, aimed at packaging pharmaceutical products in containers;

said work portions (110;130,120) of said packaging machine (100) being defined by a first work portion (120) including at least one station (121) for feeding said pharmaceutical products, and at least one second work portion (110) including at least one station (111) for production/feeding said containers;

said enclosing chamber (3) with pressurized environment enclosing said second work portion (110) and said enclosing chamber (4) with a substantially constant pressure enclosing said first work portion (120) of said packaging machine (100).

16. A method as claimed in claim 15, wherein said packaging machine (100) includes also a third work

portion (130) including at least one station (131) for closing said containers; said enclosing chamber (3) with pressurized environment enclosing said second and third portion (110,130).

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17. A method as claimed in claim 15 and 16, wherein said packaging machine (100) is a blistering machine for packaging pharmaceutical products in blister packs, in which said second work portion (110) includes a station (111) for forming blisters on a band material (115), to form, downstream of the station (111), a blister band (116); and said third work portion (130) including a station (131) for closing said blister band (116) with a corresponding band material.

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